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NOTES ON THE ARCTIC WHALING VOYAGE OF 1905.

By Thomas Southwell.

Eight vessels left Dundee in the past season for the Arctic fishery, against five in 1904, the 'Scotia' and the 'Morning' having been added to the fleet, and the ketch 'Snowdrop' of 64 tons made a speculative voyage, killing one Whale, two Walruses, and seventeen Bears, yielding 15 tuns of oil and 18 cwt. of bone. Six of these went to Davis Strait, one to Hudson Strait, and one to Greenland, subsequently proceeding to the Strait, of which more hereafter. The 'Queen Bess' took out stores to the mines in Hudson Strait, and returned with mica and furs collected there, but did not fish; and the 'Alert' is wintering at Pond's Bay.

The 'Eclipse' was the most fortunate vessel, and the first to return to port. On the outward voyage she was favoured with fine weather, and on July 6th captured two Whales; on the 8th a third was secured off Dexterity Bay. A fortnight later two others were killed, and on July 24th two more, making seven in all. On July 25th she put into the fishing station at Pond's Bay, but no Whales had been killed there. The return voyage was commenced on Oct. 14th, and was attended with exceptionally wild weather, but she arrived safely at Dundee on Nov. 6th, after a successful voyage.

The 'Balæna' arrived on Nov. 8th with four Whales. The chief event of the voyage was the meeting with a school of Whales whilst so closely beset with ice that they could not lower their boats, but, one of the Whales coming close to the vessel, it was fastened to by a harpoon fired from the deck, and secured without the crew leaving the ship—a most unusual circumstance.

The 'Morning,' having returned from the Antarctic, was purchased from the Government by Mr. Kinnes, and joined the Dundee fleet. Her catch consisted of three Whales, forty-two Walruses, and twenty-four Bears, four of which she brought home alive. The North Atlantic gave her a very rough reception, her return voyage occupying thirty-four days.

The 'Scotia,' on her first voyage to the north, left the Tay on May 4th, and proceeded to East Greenland, this being the first whaler which has visited these waters since the year 1900, when the 'Balæna' made an unsuccessful voyage to that region. Saving that she saw two Whales, neither of which, owing to a strong southerly wind rendering the condition of the ice impossible, she was able to capture, this portion of her voyage was as unsuccessful as that of the 'Balæna' had been five years ago, and, like her, on July 10th, she proceeded to Davis Strait, rescuing the castaway crew of a Norwegian sealing smack, who had been drifting in two open boats for seventeen days, on the passage. On Sept. 20th she captured her first and only fish, and bore up for home on Oct. 20th, arriving at Dundee on Nov. 9th.

The 'Windward' killed two good Whales and thirty-eight Bears, and the 'Diana' secured two others, having the misfortune to lose three; she visited Lancaster Sound, but saw no signs of the absent Arctic expeditions.

The 'Active,' as usual, visited Hudson Strait, and returned with a very miscellaneous cargo, consisting of 3 Whales, 20 White Whales, 53 Walruses, 146 Seals, 31 Bears, and 104 Fox-skins, partly collected at the station. The 'Active's' three Whales were killed by the station boats, but at such a distance that the oil had to be sacrificed; hence the disparity between her oil, which was only 5½ tuns, against 25 cwt. of bone. The Hudson Bay produce also comprised 25 Bears, 15 Seals, and 268 Fox-skins, brought home by the 'Queen Bess.' The 'Snowdrop' has already been alluded to. The existing winter stations are in Hudson Strait, Pond's Bay, and Cumberland Gulf.

During the past season more Whales were seen in Davis Strait than usual, and others were observed in localities where they had not hitherto been met with; this the captains attribute to the early break-up of the ice, and its scattered condition, until the wind from the north-east set in, when it became jammed

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on the coast, rendering the fall fishery impossible; but the season has been a very fair one, resulting in 23 Whales, 37 White Whales, 122 Walruses, 408 Seals, 200 Bears, 471 Foxes, 290 tuns of oil, and 393 cwt. of bone. The price of oil is £19 per tun, and the last sale of bone realized £2250 per ton. The total value of the season's produce may be roughly estimated at £48,000.

I am, as usual, greatly indebted to Mr. Robert Kinnes, of Dundee, for his kind assistance; and to Mr. J. Mitchell's annual circular for details of the produce.

As the present may be the last opportunity which will present itself, may I be allowed to add a few brief statistics illustrating the decay of this vanishing industry in the past century?

No history of the British Whale fishery has ever been written comparable with that from the United States of America, compiled by the United States Fishery Commission.* Perhaps Scoresby's record contained in his 'Account of the Arctic Regions' (ii. pp. 1–396), 1820, is the most complete account of the British fishery to that period; a chronological record of the chief events is given in Anderson's 'Origin of Commerce' (1801), vols. iii. and iv. Much information is also to be found in McCulloch's 'Dictionary of Commerce' (edit. 1844), and scattered through the pages of the 'Gentleman's Magazine.'

Scoresby, so accurate in all that came under his personal observation, shared the error prevailing at the time he wrote—and, indeed, long after—as to the species of Whale pursued in times long past by the Basque fishermen off the French and Spanish coasts, and which we now know to have been an inhabitant of the temperate waters of the northern oceans, quite distinct from the Polar Whale (rarely to be found south of lat. 76°), with which he was familiar; and doubtless it was his great experience of the habits of this ice-loving species that led him to suggest that the Whale hunted by those ancient fishermen might have been *Balænoptera rostrata*—a much more difficult animal to capture; but he unconsciously solves the difficulty when he tells us that Right Whales have, on rare occasions, and under peculiar circumstances, been known to occur as far south as lat. 71° or 72°, which is the northern or summer limit to the range of *Balæna biscayensis*. Scoresby also, like many others, was greatly puzzled to reconcile with Ohthere's known accuracy the supposed slaying of sixty "Whales" in two days by that traveller and his companions—a fact so simple of explanation when the passage recording the event is correctly construed (see 'Notes and Queries,' s. 7, vi. p. 44 (1888)).

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* "History of the American Whale Fishery from its inception to the Year 1876," U.S. Commission of Fish and Fisheries, Report for 1875–76 (1878), part iv. pp. 1–767. Also U.S. Fisheries Industries, Section v. vol. 2 (quarto, 1887), pp. 3–318.

It is now clearly understood that the discovery of *Balæna mysticetus* and the origin of the important industry which followed was due to the discovery of Spitzbergen, then believed to be part of the continent of Greenland, by Barants, in 1596, and the subsequent visit of Hudson in 1607, three years after which Thomas Edge commanded the first Greenland whaling fleet fitted out by the British "Muscovy Company." In 1611 the Muscovy fleet came to grief, and a Hull vessel which "happened" to be in the neighbourhood rendered them assistance. The honour therefore of being the first to initiate this important and lucrative industry rests with London and Hull, and the date of the event the year 1610 or 1611.

At a much earlier date both Hull and Bristol had vessels out at Newfoundland and the entrance to the Bay of St. Lawrence,* but their main quest seems to have been Walruses and Seals, and what Whales they killed were doubtless the Southern Atlantic species. Hull also sent vessels to Iceland and the North Cape on the same errand as early as the year 1598. Seeing the tenacity with which Hull clung to this exciting industry, it might have been expected that Bristol would have done the same, but I cannot find that such was the case. According to Latimer's 'Annals of Bristol in the 18th Century,' an attempt was made to establish a Whale fishery from that port in the year 1752, and two ships were sent out and a third in 1755, but after varying success the venture was abandoned in 1761.

From Ireland also, about the year 1737, an attempt was made to establish a Whale fishery off the coast of Donegal. A writer in the 'Gentleman's Magazine' (vii. p. 703, 1737) took a very optimistic view of the venture, but it soon came to an end, as might be expected, seeing they would be fierce and active Fin-whales that were met with in the Irish Seas.

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* Hakluyt records that in 1577 there were 315 vessels at the Newfoundland fisheries, fifteen of which were English; "there were also twenty or thirty ships from Biscay, to kill whales for train oil." Quoted from Anderson's 'Origin of Commerce,' ii. p. 144.

The Dutch opened the way to Davis Straits in 1719, and had the fishery there all to themselves for a few years before the British vessels joined them; but it was not till the year 1818 that Baffin's passage through the bay named after that intrepid navigator was repeated, and the prolific "North Water," which has ever since proved the most attractive hunting-ground, was invaded.

The Scotch took part in the fishery first in the year 1750, when a vessel was sent out from Leith, and other ports soon followed. Peterhead commenced in 1788, and Dundee, which is now the only British port engaged in the northern Whale fishery, in 1790.

The South Sea fishery for the Sperm Whale, formerly a very important industry, does not rightfully come within the scope of these remarks, but perhaps I may be allowed to say that it was, according to the 'Encyclopædia Britannica,' entirely confined to the port of London; it commenced in 1775, and was discontinued by British vessels in 1853, being now entirely in the hands of the American whalemen. The average duration of the cruise from London was three years and three months.

My object, as above stated, is to record some facts as to the decadence of this industry, but, to show how important it was in its most flourishing period, I may perhaps be allowed to quote the following figures, supplied me by the late Capt. David Gray, relating to the ports of Peterhead and Dundee to the end of the season of 1879:—

No. of Voyages.	No. of Whales.	No. of Seals.	Gross Value.	Net Value.
Peterhead:—				
995	4195	1,673,052	£2,594,400	£583,020
Dundee:—				
538	4220	917,278	2,160,400	652,320

In each case the gross value of the Whale and Seal oil, including skins and whalebone, is taken at an average of £50 per tun, an exceedingly low average compared with present prices, oil being £19 per tun, and whalebone £2250 per ton. At the above estimate the Peterhead whalers brought a net return to their owners of £586 per voyage, and those of Dundee £1212 10s.; but of course the amounts varied greatly in different seasons.

The year 1830 was a very disastrous one in the Whale fishery. Hull had eighteen vessels out, six of which were wrecked, and the loss was never recovered; this, following the discontinuance of the bounty in 1824, led to a considerable decline in the number of the vessels employed, and as they were lost or worn out they were not replaced. Thus the diminution was gradual; but the introduction of steam in 1858 not only placed the sailing vessels at a disadvantage, but, from its disturbing effects and the facilities it afforded for following the Whales in the ice-floes, rapidly decreased their numbers, and gave the final death-blow to whaling in the Greenland Seas.

In the following list of ports known to have been engaged in the northern Whale fishery it will be observed that the great majority are situated on the east coast. Where possible I have given the date when each port first sent out vessels, and, so far as I have been able to ascertain, that of discontinuing to do so:—

	Earliest Voyage.	Latest Voyage.
Bristol	1752	1755
Banff		1818
Lynn		1821
Yarmouth		1821 ?
Grimsby		1821
Liverpool		1823
Kirkwall		1825
Greenock		1830
London		1836
Whitby	1753	1837
Berwick		1837
Montrose		1839
Burntisland	1831	1839
Leith	1750	1840
Boness	1836	1840
Kirkaldy		1865
Fraserburgh		1868
Hull		1869
Aberdeen		1870
Peterhead	1788	1893
Dundee	1790,	and still continues.

Whaling vessels were also equipped by Edinburgh firms, and from Dunbar, Glasgow, Grangemouth, Queensferry, Sunderland, Stockton, Newcastle, Scarborough, Ipswich, Exeter, and Whitehaven, but I have not been able to obtain any statistics in either case.

I fear the above list is very incomplete, and should be grateful for any additions or corrections.

The following table shows the number of vessels employed, and the results of the voyages for each of the twenty-five years to which my notes extend.

TABLE SHOWING THE PRODUCE OF THE BRITISH ARCTIC WHALE FISHERIES FOR THE YEARS 1881 TO 1905, BOTH INCLUSIVE.

Year.	No. of Vessels.		No. of Whales.		White Whales.	Bottle-nose.	No. of Seals.	Tuns of Whale Oil.	Cwts. of Bone.
	Dundee.	Peterhead.	Greenland.	Davis Strait.					
1881	15	4	23	48	—	116	23,984	709	666
1882	15	3	—	79	—	413	22,142	1117	582
1883	13	6	2	17	2736	535	37,922	1148	216
1884	15	9	11	79	—	317	39,700	1224	932
1885	16	5	14	27	—	84	32,302	561	418
1886	15	4	15	19	1033	23	7964	499	371
1887	10	3	3	11 (2 suckers)	1931	20	5762	475	138
1888	10	4	4	8	902	22	15,688	314	87
1889	10	4	16	11	—	19	15,079	342	326
1890	10	4	—	18	806	22	6603	420	270
1891	9	3	11	6	569	3	1560	262	169
						Walrus.			
1892	10	1 (Newfd. only)	3	8	1309	67	12,096	298	114
1893	9	1	1	29 (4 suckers)	32	75	325	389	416
1894	8	—	4	16	1261	49	11,712	412	287
1895	7	—	11	6	1436	16	4500	349	180
1896	8	—	6	6	9	43	3890	149	135
1897	8	—	1	12	7	772	5100	228	153
1898	6	—	—	6	984	591	779	297	112
1899	7	—	—	28	—	609	3036	385	350
1900	6	—	—	17	—	632	3453	290	229
1901	5	—	—	14	738	420	3420	260	163
1902	5	—	—	12	652	118	1984	212	187
1903	4	—	—	14	79	107	3229	145	175
1904	5	—	—	11	168	45	1135	114	113
1905	8	—	—	23	37	122	408	290	339

Note.—The above table is compiled from the annual circulars of Mr. David Bruce and Mr. J. Mitchell, of Dundee.

The first column gives the number of vessels actually engaged in whaling or sealing, and does not include carriers or tenders at the permanent stations in Hudson Strait, Cumberland Gulf, and Pond's Bay, the produce of which, or that collected by the natives, is included in the general returns.

The Bottlenose Whales were obtained in the Greenland Seas in about lat. 70° N.; none have been killed by the British vessels since 1891, no Right Whales in those seas since 1897, and no Seals since 1898.

The number of Seals given above does not include those killed by the British vessels in Newfoundland.

The Bottlenose oil is included with the "Whale oil," but not that yielded by the Seals. The yield of Right Whale oil may be roughly estimated at one tun (of 252 gallons) for each hundredweight of bone.

THE PIGEON HOLLANDAIS.

By Graham Renshaw, M.B., F.Z.S.

Amid the general havoc of the French Revolution, the establishment maintained at the Jardin des Plantes was the only institution respected by the Paris mob. The zoologist who visits the natural history museum of the French capital will find much to interest him. Here may be seen the Quagga, probably the actual specimen once in the King's menagerie at Versailles; the Indian Rhinoceros, whose anatomy was investigated by the famous Vicq d'Azyr in 1793; the Blaauwbok Antelope, extinct since 1800; the Giraffe which, sent to Paris by the Pasha of Egypt, in its day was a celebrity which thousands of people flocked to see; the Black Emeu, of which but one other stuffed example is known; a curious *model* of the Dodo of Mauritius; and, last but not least, the Pigeon Hollandais.

The Pigeon Hollandais, or Mauritius Dove (*Alectorœnas nitidissima*)—the Hackled Pigeon of some writers—is an extinct species, which just survived long enough to be collected and described by scientific ornithologists. Belonging to a small group of arboreal Pigeons inhabiting the Seychelles and adjacent islands, the present species was remarkable in displaying in its plumage the three colours of the Dutch flag—hence, probably, its popular name. The bill was crimson, tipped with yellow; the iris (and a bare space surrounding the eye) was also crimson; the sides of the face were naked and flesh-coloured. The head and neck were white, and decorated with long hackles, which were, however, narrow and pointed, and shone with a peculiar gloss; the back, wings, and belly were deep indigo-blue; the rump, tail-coverts, and tail were crimson, while the legs and the powerful feet were bluish black. The length of the Pigeon Hollandais was about 13½ in. The remarkable appearance of this bird, and the rapidity with which it was exterminated unknown to naturalists, render it a very interesting species for study.

The Pigeon Hollandais is first mentioned by Pierre Sonnerat, who in 1774–81 travelled in the East Indies and China by order of the King of France. In his wanderings Sonnerat visited the Mascarene Islands; his book of voyages gives some description of Mauritius, and a figure of the Hackled Pigeon. Apparently taken from a stuffed specimen, the drawing represents the bird as standing stiffly on a branch; the eye, however, is rendered with a very natural expression of alertness, and the strong feet grasp the perch with considerable power; while the stiffness of the almost horny hackles on the neck is well brought out in the illustration. Sonnerat brought home with him two specimens of this curious Pigeon, which were afterwards acquired by the Paris Museum. His book, 'Voyage aux Indes Orientales et à la Chine,' was published at Paris in 1782, and is very interesting reading.

The Abbé Bonaterre stated, in 1790, that the Pigeon Hollandais was still abundant in Mauritius. Perhaps this accounts for the careless treatment meted out to Sonnerat's specimens, for they were allowed to become spoilt. Coenraad Temminck, the first Director of the Pays Bas Museum, which was founded at Leyden in 1827, visited Paris on one of his rambles. He found that the birds' plumage had been badly injured, but nevertheless thought it worth while to figure the species in his work on Pigeons. As a matter of fact, the fumes of sulphuric acid had been allowed to gain access to these specimens. Luckily, though damaged, they had not been thrown away, as was the Dodo in the museum at Oxford. M. Dufresne, about 1815–16, had a specimen of the Pigeon Hollandais in his collection; its previous history is unknown, and, since its possessor was a professional dealer in natural history specimens, it may have remained practically unnoticed amongst the rest of his stock. He was, however, for some time Conservator of the Cabinet of Natural History belonging to the Empress Josephine; and, since he is still remembered through that tiny bird, Dufresne's Waxbill, one may rank him as more than a mere buyer and seller of dried skins. Indeed, he afterwards joined the staff of the Paris Museum as *aide-naturaliste*, his own collection passing into the possession of the Edinburgh University. The Pigeon Hollandais was included in the series, and may now be seen in the Museum of Science and Art at Edinburgh. And then the curious Hackled Pigeon of Mauritius made a dramatic exit. Before even naturalists of eminence had realized the fact, it had disappeared from the face of the earth.

The true Quagga was exterminated about 1875, or perhaps 1879, the Spectacled Cormorant about 1850, and the Réunion Starling about 1860; but so unobtrusively did the Pigeon Hollandais vanish that even an approximate date of extinction can hardly be assigned to it. In 1862 the Acting Civil Commissioner for the Seychelles had alive ~~three~~ fully-fledged young birds, supposed to be the true *Alectorœnas nitidissima*; but the Seychelles themselves are the habitat of the closely allied *A. pulcherrima*, and some confusion may have unwittingly occurred between the two species. The wild Pigeons occurring near Savanne, Mauritius, in 1861, though at first supposed to be *nitidissima*, turned out to belong to another species. The only veritable specimen unearthed of late years seems to be the Pigeon Hollandais (already stuffed!) in the Port Louis Museum.

As for the causes of extinction, one is tempted to draw a parallel between the present species and the Réunion Starling. Thousands of Mynahs introduced from India swarm (or swarmed) in Mauritius, as they do in Réunion. Perhaps they were too fond of eggs and nestling Pigeons, and so effected the exit of the Mauritius Dove. Then, again, the planters may have exterminated the bird, for the surviving representatives of the genus *Alectorœnas* are notorious for the damage they do to the rice crops.

The young birds owned by the Civil Commissioner for the Seychelles would only eat berries and small fruit; so arboreal were they that they would not alight on the ground if they could help it, preferring to stretch down from their perches and crane their necks to a considerable extent to pick up their food. This circumstance reminds one of the similar tactics of the pretty Bengal Fruit-Pigeons (*Crocopus*), as anyone who has kept these latter in captivity will admit; since the Pigeon Hollandais was about the size of a *Crocopus*, and probably once swarmed in the hill-forests of Mauritius, the settling of a flock amongst the crops might by their mere weight do considerable havoc. The actual cause of extinction will, however, in all probability never be known.

In 1889 the Government of Mauritius appointed a Commission to inquire into the "Souvenirs Historiques" of the island. Under the able direction of Mr. Théodore Sauzier, the party continued the exploration of the marshy Mare aux Songes, which had already yielded many Dodo relics to previous workers. A considerable number of valuable specimens rewarded the industry of the Commission. Bones of the extinct Parrot (or rather Cockatoo), *Lophopsittacus mauritianus*, were unearthed, together with relics of the *Fulica newtoni*, and many other species. Ornithologists may perhaps remember this exploration from the magnificent Dodo skeleton then obtained, perhaps the finest in the world. Our present interest, however, centres on the fact that amongst the remains were the bones of a bird believed to be the Pigeon Hollandais. Thus associated with the vanished Dodo and Mauritius Cockatoo, perhaps the *Alectorœnas* was itself already on the wane. Unknown natural causes may have been working its downfall long before the day of Sonnerat and Dufresne.

Uno avulso, non deficit alter. The Pigeon Hollandais lives again, Phœnix-like, in its near relation, the *Alectorœnas pulcherrima* of the Seychelles. Indeed, the Seychelles bird is now actually called the Pigeon Hollandais! This understudy certainly bears some likeness to its lamented cousin. Grey on neck and breast, the *pulcherrima* has the upper parts and tail black shot with blue; a crimson patch decorates the crown of the head, and the orbits, lores, and forehead are bedecked with wattles.

Long may the Seychelles Pigeon flourish, and may it escape the fate which has overtaken its predecessor in the title! Man has exterminated the Labrador Duck, the Spectacled Cormorant of the Aleutian Islands, and the Black Emeu. During the last five years the greed of the museum collector has all but finished the Chatham Island Rail. The enlightened action of the New Zealand Government in establishing a bird sanctuary in Dusky Sound will appeal to all nature lovers, while in the three museums of Edinburgh, Paris, and Port Louis the remains of *Alectorœnas nitidissima* plead silently yet unceasingly the cause of bird protection.

NOTES ON MARINE CRUSTACEA IN CONFINEMENT.

By Albert H. Waters, B.A.

I have from my very childhood had a *penchant* for keeping marine aquaria. I started my first one at Great Yarmouth, when residing there as quite a youngster. It was there that I made acquaintance with the Common Shore Crab (*Carcinus mænas*), and, by the way, I was beguiled into eating one or two which someone had put in a saucepan of water and boiled. I had them for tea, and survived it! But my interest was more with the living Crabs as creatures to be watched moving about in a vessel of sea-water, and I did not personally regard them with gastronomical eyes. From that day to this I have seldom been for long without living specimens of these Crabs—not to say others. What has always been an attraction to me is their readiness to adapt themselves to circumstances, and become on good terms with me. I have had them so tame that they have gently taken meat from my fingers without attempting to pinch them. What the amount of their intelligence really is I cannot say, but I could write a volume on the psychology of these and other marine creatures I have had under observation, especially in the days when an injury to my spine made me a prisoner, and my aquaria and vivaria were some of my solaces. Just as prisoners in a dungeon have learnt things about the ways of spiders, and even tamed them, so, when my injury made me delicate in health, I learnt from my aquaria and vivaria traits in the nature of the lower animals I might never have known had I always been healthy and strong; for then I should have been so employed as not to have the time for careful observation.

As I have mentioned the Shore Crab, I may as well commence with this common member of the *Portunidæ*. I have been able to study its life-history from the ovum to the aged crab, and, when I say that I have had the same individuals living for years, I think I may claim to have had opportunities for observation of some value.

As a rule, two Crabs will not live together for long in a small aquarium. Sooner or later they will have a desperate battle, and the weaker will get killed. In one case I rescued the vanquished *mænas* before he had lost his life. He was in a parlous state, having lost both his claws and three of his legs. I transferred him to a small inverted propagating glass, and carefully fed him; much as one feeds a baby with a spoon, so did I put morsels of scraped beef on to his mandibles with a wooden skewer. He used the foremost of his remaining feet to push the food into his mouth, reminding me of an armless man I saw in a show at Cambridge Fair who fed himself with his toes. He was in this miserably crippled condition for weeks. At last came the time for the exuviation of his shell; then, lo! as by a miracle, he appeared straightway with his full complement of legs and two pairs of claws, just as if nothing had happened.

The day before the Crab exuviated there had not been a vestige of claw to be seen or of the three vanished legs. There was no sign whatever of sprouting and gradual growth. When the old shell was cast off the new limbs grew as quickly as do the wings of a butterfly or moth when released from the chrysalis-case; they grew so quickly that I did not see them grow. One hour the Crab had no claws and only five legs; in the next, when I again noticed him, he was soft and flaccid, but with every one of his limbs quite perfect. The new shell rapidly hardened, and the next day the Crab was using his new claws just as if he had never lost them. I put the exuviated shell in my little museum, and when the Crab exuviated again I put by the side of it the newly-formed shell with the full complement of claws and legs.

Out of the many specimens of *Carcinus mænas* I have had under observation I have never noticed a single instance of a new limb sprouting out and growing gradually in the manner I have seen described in books. A lost limb has always been instantaneously, as it were, reproduced at the time of exuviation.

Yet sometimes we meet with Crabs of the edible species having one large and one small pair of pincers and claws. Personally, I have only met with one instance of this. In that specimen one claw is rather more than twice the length of the other, and it is, I think, analogous to the crippled wing of a moth. It is well known that such a slight cause as the sticking of a piece of the chrysalis-shell will hinder the development of the wing, and if its growth be arrested it will never expand to its full size, for the soft ductile substance of the wing is in an incredibly short time acted on by the gases of atmospheric air, known or unknown, and converted into chitine and membrane. Something similar goes on in the case of the shell of a Crab. At first it is quite soft, with apparently no more substantiality than the body of a jelly-fish, if so much. It is just a sort of gelatinous slime, which subsequently becomes like a double membrane, enclosing water or gelatinous slime between it. Then changes ensue so rapidly that I have never been able to follow them with the microscope.

I had, some little time ago, the idea of making a combination of microscope and cinematograph camera, and then examining the long strip of film in detail. I greatly regret I was unable to afford the outlay, as I believe much might be learned by this means about processes too rapid for investigation with unaided vision.

Carcinus mænas lives ten years and more I know, but how much longer I am unable to say from personal observation. A Crab ten years old has exuviated for the last time, and done growing. Its shell has become a resting-place for barnacles, and possibly seaweeds may be growing thereon. A patriarchal Crab I had died last spring, killed by a frosty night; its shell was covered with acorn barnacles, which seemed to enjoy being carried about, now in and now out of the water.

The Shore Crabs do not seem to be able to stand very cold weather, and I have lost many I had hoped to have kept to extreme old age. They bury themselves in the sand as soon as the temperature falls below forty degrees, and would retreat into deep water if they could.

The Edible Crab is far inferior to the Shore Crab in intelligence, and not so easily tamed; but it is not particularly difficult to keep in captivity if one feeds it carefully. It is not happy unless it has stones to hide under, and most of its time seems to be spent asleep. It is the longest lived Crab I am acquainted with, and grows very large before its final exuviation—if it ever leaves off moulting at all until it dies. I do not like to hazard a guess as to the length of life to which it will attain. I have seen more than one which, judging by the rate of growth of those I have had under observation, must have been considerably older than I am. Not one of my aquaria is large enough to contain specimens of the size which those I have kept might have grown to if they had had more room. They require far more water than the Shore Crab does. The latter I have kept fairly successfully in cages with just a pan of sea-water for them to bathe in, but the Edible Crab will die unless wholly immersed, and is not happy unless the water is deep, and in plenty. I only wish it had been my good fortune to have had charge of the tanks in the Crystal Palace Aquarium or at Brighton. I should have enjoyed nothing better. In such deep tanks as these the Edible Crab is at its best.

Other species of Crabs which I have kept with more or less success have been the Swimming Crabs (*Portumnus*)—very interesting crustaceans, but needing larger aquaria than mine. My largest tank was five feet long by two deep, and twenty inches wide. I was not able to work out the life-history of these Crabs so thoroughly as in the case of the shallow water Crabs. Then I have had the long-armed Masked Crabs (*Corystes cassivelaunus*), very interesting to me as being living representatives of some I used to find fossil in the Cambridge greensand, and labelled *Notopocorystes bechei*.

Not the least interesting of my Crabs have been the Hermit Crabs. It is most comical to see them change from one domicile to another. A curious trait in their character is that they seem to like company. To name them after a monk is singularly inappropriate to those who know how fond they seem to be of the society of creatures lower than themselves in the scale of life. The association between the "Hermit" Crab and the Cloaklet Anemone is well known, but I had a Pagurus which permitted a large Nereis to live with it in a Whelk-shell and share its food. It neither quitted the shell in disgust nor tried to kill the intruder, as it might easily have done when the worm came half out of the shell.

Then I have kept the long-legged Spider Crabs and the

Shorter-limbed *Hyas* and *Maia*. The most remarkable trait of the latter has been the fancy it has for sticking pieces of seaweed on the short spines which are beset all over its body and limbs.

For thirty-five years my aquaria have never been for long without some representatives of the Prawns and Shrimps. I have been specially interested in the former because of the marvellous transparency of their bodies when in health. One which I had more than thirty years ago, and which lived a long time—even breeding—I called "Crystal," because she looked as though made of glass. She was not the only one I have had breed. I have kept sometimes as many as two hundred small larval Prawns at one time.

(To be continued.)

A NOTE ON THE *ARANEÆ* AROUND YARMOUTH.

BY RICHARD HANCOCK.

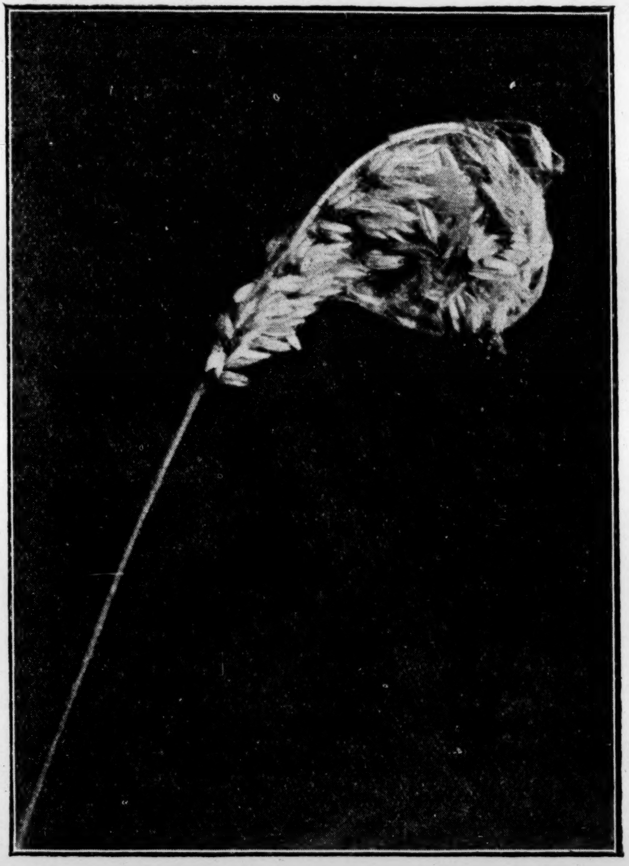
IN August last I had the pleasure of spending a few days' holiday with Mr. Arthur H. Patterson, of Great Yarmouth. I started away from home with the idea of spending several days collecting the Spiders of the immediate district, but could not break away from the charms of the houseboat and its owner; so that consequently little collecting was done. However, although my captures were but small in number (some thirty-one species only), some of them I had not found in my own county (Warwickshire); while one of the *Erigoninæ*, viz. *Neriene affinis*, Bl., has only been found on three or four occasions in England, and is remarkable for the great length of palpus and the smallness of the digital joint, while the falces have a peculiar denticule or tooth near the middle, and directed towards the inner surface. It is found also on the Continent, being the type of the genus *Tmeticus* of Menge, viz. *Tmeticus leptocaulis*. I was indeed pleased to be able to record this rarity.

One afternoon I went to Belton, a little straggling village about four miles away, and spent a couple of hours on some marsh-land near the station. Within an area of some three hundred yards square I found fifteen species, several of them in great numbers. On the stems of the sedges were many silken tubes having open ends, containing one of the *Drassidæ* (*Clubiona neglecta*), a sombre-looking spider, as, indeed, nearly all of this family are.

The very handsome Orbweaver (*Epeira quadrata*) was found in large numbers in its snare, or in its little silken nest near by; while in close proximity were numbers of another interesting species (*Epeira cornuta*), which had bent over the flower-heads of the grasses into a coil, bending them up with silken cords, forming heads somewhat similar in outline to that of a bishop's crozier. Having an oblong tin-box with me, I brought several of *cornuta's* domiciles home with me to photograph.

I have always ridiculed the idea of the bite of any of our British species being hurtful to any degree, but am afraid shall have in future to except that of *Epeira cornuta*. One stout female resented being held in the hand for a moment, biting viciously, holding on to the thick part of my thumb for a few moments, drawing the blood.

The following day we went up to the houseboat for a quiet chat, and on going for a ramble before returning home across by Banham's farm, on passing a disused stable, we saw a pitched battle going on between a little army of winged ants and a number of the very common Orbweaver (*Zilla* × *notata*), whose webs were in great profusion at the edge of the roof-thatch. Unfortunately for the ants it was a one-sided affair, for they had



Home of *Epeira cornuta*.

little chance against the wiles of *Zilla*, and on coming to close quarters with the snare soon succumbed. It was interesting watching the *Zillas* at work, running here and there on their orb, too busy to return to their tubular retreat, such good luck coming their way but seldom. It was a day to be chronicled in their life-history, and the next few days would be for them an incessant round of feeding, until their jackets would not stand the strain any longer and burst. The moulting of this little colony of *Zillas* would probably occur long before that of their half-starved brothers at the back of the shed, but little cared they for this, for Spiders are selfish creatures, and think only of themselves.

A most pleasant afternoon was spent on Filby Broad, and, after a good row round its borders, I made for a private jetty, to have a search for some of the night-roving species lurking under the loose bark of the piles driven into the lake. Here the evil-looking Shadow Spider (*Epeira umbratica*) was found in all stages of growth, and some *Drassidæ* (*Clubiona pallidula* and *C. holosericea*), while a female of *Drassus lapidosus* was captured. I found, too, a number of specimens of what I think is one of the most handsome British species (*Segestria senoculata*), one of the few six-eyed Spiders that are found in the British Isles.

Altogether I turned into a tube of methylated spirit some thirteen species in the short time I was around this jetty, and, on putting off, feared the owner might require summary vengeance for bark-stripping his property. If he is a "nat," and reads these lines, he will forget and forgive, for all naturalists have sometimes to sail close to the wind to obtain specimens for their cabinets.

A walk one morning along the road to the old ruins of Burgh Castle will remain long in my memory, for it was on some palings a short distance from the Southtown Road that I found the Erigone which I have mentioned. I saw numbers of the commonly distributed Lycosid (*Pisaura mirabilis*) in their nests in the hedge-banks, with the young clustered around, and it seemed remarkably late, for in the midlands the young had dispersed weeks before. The interesting "Grass-field Spider" (*Agelena labyrinthica*) was fairly abundant, lying in its tubular retreat, ever ready to capture any insect that should alight on its sheeted web. This species being one of the few that live in amity, the pair are often captured together, and make excellent examples to keep under observation in one's study. Their nest is a fine example of a spider's engineering skill, their silken cocoon being suspended in the centre of a many-chambered nest. I have at the present time, in an observation cage, a female which has built an elaborate cocoon chamber, decorating the outside with the bodies of flies with which she has been liberally supplied for some months.

Owing to the few hours given over to the search, I obtained but few species of many of the larger groups, but I am quite sure that a systematic search by a few good workers throughout the county would reveal large numbers of species, some perhaps of a rare and interesting character. Until a few collectors and students of the *Araneæ* can be found in every county to take a deep interest in this interesting class of creature, one cannot hope to know much of the comparative rarity or otherwise of many of the species. Let us hope that this time is not far distant. For myself, I am looking forward to that time when I can pay another and more extended visit to this district, when I shall hope to add considerably to my list of species.

A PLEA FOR THE FURTHER RECOGNITION OF SUBSPECIES IN ORNITHOLOGY.

By W. Ruskin Butterfield.

When Linné proposed his great reform of binomial nomenclature species were universally believed to be perfectly circumscribed and immutable groups. Men's ideas of species have, however, like species themselves, undergone changes. But it is still the usual practice in this country to treat as "species" all forms that in the opinion of the describers are separable, no lower classificatory unit being recognized. It can hardly be doubted that this conservative method of treatment has greatly hindered the progress of ornithology, and in the following remarks I venture to urge the importance of paying due regard to subspecies.

By subspecies are here meant the recognizable geographical forms or components of a species, whether these components occupy continuous or discontinuous areas—in other words, whether they intergrade or do not intergrade. Some ornithologists who admit subspecies restrict the term to intergrading forms, while forms that do not intergrade are elevated to specific rank. On the other hand, separate treatment is not accorded geographical intergrading forms by ornithologists who refuse recognition to subspecies.

The evidence of subspecies is clear enough when a large and representative series of a widely-ranging species is examined, e. g. *Certhia familiaris*, *Galerida cristata*, *Parus palustris*, *Aluco flammea*. The most cursory examination shows that such an assemblage is not an homogeneous assemblage, and when the specimens are arranged geographically the whole series is seen to break up into a number of subordinate groups, the proper delimitation of which is only possible when a large number of specimens are available, and when they are derived from many portions of the range. Of course, the number of examples of a widely-distributed species to be found in any collection bears but a very small ratio to the whole assemblage forming the species. The question therefore arises whether, if a sufficiently large number of individuals of a compound species inhabiting a continuous area were forthcoming, they would not present a perfectly graduated series. It is enough at present to reply that, as the available material increases, the evidence of subspecies becomes strengthened. In some cases, indeed, instead of a graduated series, it is found that examples from opposite confines of the range of a species resemble one another more closely than they resemble examples from intermediate regions. Thus our native Long-tailed Tit and Tree-Creeper are nearest to those from Japan, and Marsh-Tits from Pekin can hardly be distinguished from the North Italian form.* Moreover, contiguous forms of the same species sometimes differ considerably.

I believe the main reason that subspecies are more generally recognized by ornithologists in the United States than in the British Islands is that it was in the former country that the importance of large series was first perceived.

Racial differentiation being, then, a concomitant of distribution, it becomes necessary to find some means of designating the subordinate groups if account is to be taken of them, and the most convenient means yet devised consists in using trinomials. The nomenclatural value of subspecies cannot be expressed within the limits imposed by the binomial system. No justification can be found for the suppression of the middle term of trinomials when describing avowed subspecies, as is the custom of some ornithologists, who thereby obscure the status of these forms. It is obvious that an ornithologist who designates a new subspecies binomially does not encumber nomenclature and tax the memory to a less degree than if he were to name it trinomially, since in the latter case the second term is always one in current use.

It is often urged in opposition to subspecies that they are frequently based upon very trifling characters, and thus lead to much subdivision. A feature, however, that appears trivial in a single individual, or in a few individuals, at once assumes importance when it is found in a large series. To an accustomed eye a feature unnoticed by others may appear conspicuous—"Man sieht nur was man weiss." Even the most inveterate "splitter" has some grounds for his subspecies, and it is hardly fair to condemn his work without a knowledge of the material upon which it is based. When one looks over a large series of skins of a compound species so arranged that the geographical components are separated by spaces, it is possible to appreciate at a glance differences that are most difficult to state formally in diagnoses (*cf.* Dr. J. A. Allen, 'Science,' n.s., xvi. pp. 383–386). It should not be required for the institution of a subspecies that it be conspicuously different from others. A character or combination of characters, however small in amount, is sufficient if thereby we can distinguish a form, but it is essential that the character be supported by adequate material. Opponents of subspecies are not alone in deploring the practice of founding new forms upon one or two specimens; sometimes, indeed, without comparing them with reference to sex or date.

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* I am enabled to give these instances through the kindness of Dr. Ernst Hartert.

In giving recognition to characters that are small in amount but constant, the "splitter" is rendering a service to science, for we may expect to gain a truer view of the derivative origin of species by attending to the smaller and more immediate products of variation, rather than to the larger and more remote.

There seems to be a widespread feeling that, if subspecies are persisted in, it will be injurious to the study of birds (*cf.* 'Ibis,' 1904, p. 660). It is easy to reply to this argument by referring to the United States, where subspecies are much attended to. No one will affirm that their recognition in that country has had this effect.

The non-recognition of subspecies often causes important points in distribution to be overlooked. As an instance it may be mentioned that two forms of Nutcracker are known to visit this country, but they are usually placed together under the name *Nucifraga caryocatactes*. There is reason to believe that the majority of recorded specimens refer to the eastern form, *N. caryocatactes macrorhynchos*, Brehm, and that the western representative, *N. caryocatactes caryocatactes* (Linn.), is of very infrequent occurrence. It is clearly of importance to distinguish these two forms so that we may know whence any Nutcracker that may visit us has wandered.

BIRD-NOTES IN SWITZERLAND AND GERMANY IN JUNE AND JULY, 1905.

By the Rev. Charles W. Benson, LL.D., Rector of Balbriggan.

As a summer chaplain for the Colonial and Continental Society, I sojourned at Schinznach and Strassburg during the months of June and July, 1905, and spent most of my spare time in observing the birds in those two places, and in the regions round about.

Schinznach Bad is in the Canton Aargau, in the north of Switzerland, about two hours distant from Basle, and forty-five minutes from Zurich, and is one of the pleasantest places I ever visited in Switzerland or anywhere else. Our hotel was situated in grounds abounding with birds, whilst the Aare ran foaming downwards through the woods to join the Rhine, uniting before it did so with the Reuss from Luzern and the Limmat from Zurich. We had thus river birds and birds of the woodlands in large numbers, and I made a list of sixty-four species there.

Quite close to the hotel there were many interesting birds, such as the Blackcap, Garden-Warbler, Serin Finch, Goldfinch, and the two Redstarts; whilst in a walk of about half an hour it would have been possible to find nearly all the species I observed. The Warblers on my list included the Blackcap, Garden-Warbler, Willow-Warbler (not common), Chiffchaff, Sedge-Warbler, Wood-Warbler, Whitethroat, Bonelli's Warbler, and the Icterine Warbler. This last bird I heard in marshy ground near the Aare, and I felt some doubt at first as to its identity. It began its song with a few peevish notes—something like "aye, aye, aye"—before it launched out into its delightful song, which, however, was somewhat marred by certain jarring notes. I heard it not only near the river, but also in the fields, and in the streets of Strassburg, of which more anon.

Orioles were very plentiful both at Schinznach and at Strassburg, but they were always difficult to be seen. We heard them every day, and almost everywhere the "wheet le veo" of the Pirol or Gold Amsel revealed the presence of this beautiful bird. The clear whistle can be readily imitated.

A Grey Woodpecker (*Picus canus*) (Grauspecht) nested quite close to the hotel. At first I took it for a Green Woodpecker, but the note seemed so much softer that I observed it more closely, and finally identified it as *Picus canus*. I also saw one in Strassburg. He sometimes appeared on the top of a tree near the hotel courtyard, and thus verified Naumann's description: "Der Specht sitzt dazu allemal auf der Spitze eines hohen Baumes, und so schallen diese herrlichen Töne weit in den Wald hinein."

It was very remarkable to see the Terns fishing on the Aare; it seemed almost impossible for birds to pluck fish from a stream running at the rate of nearly ten miles an hour, yet they seemed to live and thrive. They often hovered, like Kestrels, over the river, and the alders near it, in a captivating manner.

There were not many Storks in our neighbourhood at Schinznach; Lensburg and Umiken had them, but Brugg had not, nor did we see any at Baden or in the Black Forest, which we afterwards visited. The Lesser Spotted Woodpecker was called in our neighbourhood "der kleine Zimmermann" (the little carpenter)—a pleasant name.

On June 13th I walked with my wife to Brugg, about three miles distant, on a very pretty road, with woods on our right hand and the valley of the Aare on the left. As we approached the town I heard the cry of a bird quite unknown to me proceeding from a potato-field which lay below the road towards the river. I got down at once into the field, and there I saw a brownish bird running about among the furrows and crying "pip, pip, pip" in a loud tone, somewhat resembling that of a chicken. I drew near cautiously, and had an excellent view of it as it ran before me, looking back at me with its head turned round slightly to see whether I was following; it made no attempt to fly. The general tone of the plumage was brown, and the bird seemed to be somewhat the size of a Lapwing. It had black bands, and a very conspicuous white one lower down on the breast. I took it for some species of Plover, but was obliged to defer identification till I visited the museum at Basle on June 29th, where I saw at once that it was the Little Bustard (*Tetrax tetrax*)—in German, "Zwergtrappe." The birds were doubtless young ones, and when in Strassburg I found that there was but one specimen in the Zoological Museum, and that none had been observed in Alsace since 1853. My list at Schinznach was sixty-four species.

Strassburg I found to be an excellent bird-station, and there I observed seventy-two species. Most of these I had previously noted at Schinznach. The Serin Finch seemed to be the characteristic bird of Alsace—or rather Elsass—as was the Chaffinch of Switzerland. In the very hottest weather—and we had the temperature on some days in July up to 95°—the unwearied "buzzing" song of the little Serin could be heard and he himself seen in tree-tops or on telegraph-wires everywhere.

Our pension in the Universitätstrasse had opposite to it the University Botanical Gardens and Observatory, and beside it the Zoological Museum, where I was very kindly received by the Director, Herr Döderlein, and his assistant, shown the various specimens, and allowed to make extracts from Naumann's great work and others. I had also the honour of making the acquaintance of Geheimrath Dr. Julius Euting, University Librarian, and President of the Vogesen Club, who gave me a great deal of interesting information about the Storks and other birds at Strassburg. He said that the following birds nested in the cathedral spire and towers: Kestrel, Jackdaw, Common Swift, and domestic Pigeon; but that the number of Storks breeding in Strassburg had of late years greatly diminished, and that whereas twenty or thirty years ago there were as many as one hundred and twenty nests in the city, this year there were but nine. He attributed the decrease to the universal burning of stone-coal instead of wood; the birds greatly disliked the fumes of the former. He gave the date of their arrival about mid April, and of their departure about Aug. 15th.

On July 4th I looked out at 3.15 a.m., just as day was dawning, and heard a few notes of celestial music, as it seemed to me; a Lark, and yet hardly a Sky-Lark, there, I thought. Next morning, at seven o'clock, I heard it again, and then saw that it proceeded from a Lark singing on the top of a high house nearly opposite. On inquiring at the museum I found that this bird was the Crested Lark (*Alauda cristata*)—in German, "Haubenlerche"—and that there were two nests on the roof of the Zoological Museum. Both were smashed to pieces by the hail during a terrific thunderstorm which occurred while we were there, the temperature falling from 95° in the shade to 64° in twenty-four hours.

At the Orangerie, a beautiful park, said to be the finest in Germany, I saw, but did not hear, the Nightingale, and in the Black Forest and also in the Vosges Mountains I observed the Crested Tit; but other birds were scarce. The Greenfinches in Strassburg had a few notes which I never heard anywhere else; and the Icterine Warbler—called there "Gartensänger"—could be heard every day in the gardens near the university, but the time of the singing of Nightingales was past. On the whole I noted eighty-five species during June and July, but there were two which I failed to identify—frequently heard, but unseen. Perhaps some of your readers might be able to solve the mystery:—1. From the marshy ground near the Aare I heard what I can best describe as a "desolate" cry—"kra-ah-ah"—and one evening saw a large bird high in the air, flying with neck stretched out rigidly. Could this have been a Crane? 2. We frequently heard a soft melodious note of a few syllables, something like the "rippling" note of the Little Grebe, but louder, sweeter, and more of a whistle, with about as many syllables as in the well-known cry of the Whimbrel. I never saw the bird, but constantly heard it, sometimes near water, but on other occasions in a meadow some distance away. Could the Little Grebe have any notes other than those we usually hear, for on one occasion at Neuhof I heard the well-known note of the Little Grebe followed immediately by this louder and richer cry?

NOTES AND QUERIES.

MAMMALIA.

Notes on Cave Bats.—On February 22nd, 1905, I found a bunch of Lesser Horseshoes hybernating in one of the lower chambers of a Mendip cave. I have many times searched this cave through the upper as well as the lower chambers purposely for Bats, for I know several species to exist therein, but this particular find was, I should think, an exceptional one; they occupied a small fissure in the rocks above my head, and were hanging in a bunch one from another. The cavern is very dark and extremely dangerous, as Mr. Rothschild's representatives can well testify, immense gulfs yawning out beneath you every here and there, with perhaps a sheer drop of a hundred feet into the river which flows through and here finds an outlet from the Mendip Hills, the river entering the cavern at the further end of the bottom chamber. Human remains, also bones of the Cave Bear, have been found in this spacious and lofty chamber. Fixing my lighted candle against the rock, I managed with difficulty to take one of the lower specimens, which I sent to Mr. Lydekker, informing him of the find. Five species of Bats live, and no doubt breed, in this cave—the Barbastelle, Greater and Lesser Horseshoes, Noctule, and one other species which I have found and located, but have not yet secured. The Greater Horseshoes are not so easily disturbed as the smaller species during the period of hybernation; they take but little notice of the light, and seem altogether drowsier, and when touched just lift themselves up a little with a faint squeak, and settle down again. The Lesser Horseshoes fly about the cave during hybernation, but I think only on account of having been disturbed; for instance, having found three or six at the commencement of a chamber, we *may* leave them for the return journey, when we find they are gone. These, I think, are "disturbed flights," but which I have not found with the Greater species. Moths hybernate singly on the boulders of rock here; this proves that the Bats do not take food, or else that the moths are sufficiently protected from them, their colour so nearly resembling the sandy rock on which they sit. I had been many times to the cave before, when, in company with Mr. Goodson, of Tring, I noticed one of these moths, and then we could find several. On Aug. 26th, 1905, I sent three Noctules to Mr. Lydekker for the Museum. I smoked them out of a hole on the cliffs, where there appears to be a small colony. These Noctules fly about with the Horseshoes, but I do not think occupy the same place or chamber when hybernating. I am probably correct in saying that these three specimens were males. On July 26th, 1905, there seemed to be more Bats than usual about, but it is difficult to get them in the net; they dodge wonderfully quick, a fact that seems remarkable when one examines their tiny and seemingly obsolete eyes. However, on this date I sent Mr. Lydekker four Greater Horseshoes, one proving to be a young member, which differed from the adults in its coloration, and, until he informed me, I thought it was a Lesser. I intend searching portions of the cliffs at Cheddar this winter, when I may be able to collect a few more notes of interest. Stanley Lewis (Wells, Somerset).

Whiskered Bat (Myotis mystacinus) and Lesser Horseshoe Bat (Rhinolophus hipposiderus) in Denbighshire.—The Whiskered Bat is probably not uncommon in Denbighshire, although, as far as I know, it has not been hitherto recorded for the county. On Jan. 14th Mr. F. Brownsword and I found one in an old mine tunnel in the Upper Silurian rocks of a wooded valley at Coed Coch, four miles south of Colwyn. The Bat was hanging, asleep, on the wall, only five feet from the tunnel-mouth, and the presence of fæcal matter in its intestines suggested that it had been feeding recently. Little is known of the depth or duration of the winter sleep in this species, and it is possible that the individual in question had gone outside to obtain food; though not necessarily so, for hybernating on the dry walls of the tunnel were gnats and other dipterous insects, and the two species of moths, *Scotosia dubitata* and *Gonoptera libatrix*, which one usually sees in such places during the winter. Near the end of another tunnel in the same valley, which had been driven into the hill-side for a distance of ninety yards, we found two Lesser Horseshoe Bats, a male and female. These were hanging about ten yards apart, and, owing to a sharp turn in the tunnel a few yards from its mouth, were in absolute darkness. They were less lethargic than the Whiskered Bat, and, though tightly enfolded in their wing-membranes, were apparently conscious of our presence, for before we touched them they raised their bodies by flexing the legs, and swayed slightly. There was water to the depth of some inches on the floor near the mouth of the tunnel, and the walls were wet in many places; but, although we saw neither moths nor flies here, the presence of fæcal matter in the intestines of the Bats seemed to indicate that they too had fed recently. — CHARLES OLDHAM (Knutsford).

Mus alexandrinus at Yarmouth.—Mr. Rumbelow (*ante*, p. 26) is, I think, correct in stating *Mus rattus*, and its compeer *M. alexandrinus*, are on the increase hereabouts. I am constantly hearing of their appearance in fresh quarters, and very little to their credit. Cats are very fond of hunting them, and eagerly eat them, leaving only the snout and teeth. The Rats themselves are not averse to anything that promises the least nourishment, and are not above nibbling the toe of a sound sleeper. A house in which a babe was some time ago seriously mauled by Black Rats has since been shut up, for the smell of those poisoned, after the carpenters had been at work, has made the place as insanitary as it was before unsavoury. In warehouses, dates, eggs, jars of jam—anything, in fact, is fish in their net. Passing a sail-loft on January 25th, a sailmaker asked me if I could do with a couple of Rats, "one of 'em a *clinker*!" i.e. an extraordinarily large one. I gladly accepted, and sent them to Dr. S. H. Long, of Norwich, who is much interested in the species. One was a jet-black male *Mus rattus*, the other a very large example of *Mus rattus alexandrinus*. As it differs slightly from one referred by Mr. J. G. Millais as coming from Yarmouth (Zool. 1905, p. 203), I have thought it worth recording. Measurements:—Head and body, 8¼ in.; tail, 9 in.; weight, 7¼ oz. Body of a smoke-brown generally, with slightly darker hair on the back, and of a lighter hue below. Both fell victims to their love of Russian tallow, not a scrap of which that sailmaker dare leave about at night, except some placed in a trap for their especial benefit —and his own. When writing a very tarry smell emanated from the hides of both Rats, due to their having made their beds of such tarry twine as they found lying about the loft. — ARTHUR H. PATTERSON (Ibis House, Great Yarmouth).

AVES.

Breeding of the Twite. — Mr. Butterfield (*ante*, p. 32) asks for authenticated instances of the Twite breeding south of Derbyshire. I have a clutch taken two years ago in Devonshire. They were found by a friend who identified the parent birds, and kindly sent me the nest and eggs. These were exhibited at a subsequent meeting of the British Ornithologists' Club, and a note on the subject will be found in its bulletin.—CHARLES E. PEARSON (Hillcrest, Lowdham, Nottingham).

Cirl-Bunting (Emberiza cirlus) in Cheshire.—On Jan. 23rd, 1906, I was fortunate in seeing a small party of Cirl-Buntings feeding together on the Dee Cop, about a mile from this city. There were about eight or ten of them. With binoculars I had a good view of a male not many yards distant, before they took flight across the river, besides hearing their thin characteristic call-note, which alone would put all question as to identity beyond doubt. I have found this interesting bird not uncommon during the breeding season in certain districts in the neighbouring counties of Denbigh and Flint, but hitherto there has not been any authentic record of this species in Cheshire, so far as I know. The nearest place to the Cheshire border where I have previously met with the bird is Hope, Flint, some three and a half miles outside the county boundary, where I heard one in full song on Aug. 10th, 1905.—S. G. CUMMINGS (Chester).

Shore-Lark in Cheshire.—Mr. Lewis Jones, of Hilbre Island, informs me that on Dec. 19th, 1905, he watched a Shore-Lark (*Otocorys alpestris*) on that island. He was about eight or ten yards from the bird, and was able to make a rough sketch of it, showing the distribution of colour. Mr. Jones kindly showed me this sketch, and there is no doubt about his identification of the species, and, as he did not notice the erectile tufts above the eyes, it was presumably either a female or an immature bird. He has never before seen a Shore Lark at Hilbre, and this is apparently the first record for the county, though the species has been met with on the Lancashire coast north of the Mersey Estuary.—T. A. COWARD (Bowdon, Cheshire).

The Cuckoo and its Foster-parents.—Mr. Tuck's caution with regard to spurious Cuckoo clutches (Zool. 1905, p. 434) is very necessary for these times. In pursuing my search for an authentic instance of a Cuckoo's egg deposited by the parent bird in a Twite's nest, I have not found it easy to discover one which would command universal acceptance, though I have come across a good deal of evidence that Cuckoo clutches are not infrequently made up by unscrupulous persons for the benefit of incautious oologists. Great circumspection should be exercised before accepting a rare Cuckoo clutch as authentic, when it is remembered how easy fraud is in the matter, and how difficult to detect. During my investigations I had the pleasure of examining some two hundred Cuckoo clutches in one private collection, which had been purchased but not yet examined or arranged by the owner, who is one of our most famous ornithologists. Among these were two clutches in which the "Cuckoos' eggs" were obviously a Sky-Lark's and a House-Sparrow's respectively! There were about twenty clutches of Greenfinch, Linnet, Bullfinch, or other seed-eating birds, with Cuckoo's eggs, but nearly all of these had been obtained from one neighbourhood by one obscure individual, whose initials were given as authentication. I have examined one clutch of Twite with Cuckoo, and have been informed of several others, but all these were obtained by Mr. James Ellison from Steeton Moor, Yorkshire, the authority referred to by Mr. Booth (Zool. 1905, p. 433). Two other dealers from whom I have heard, who have collected on moors near the same district—one of them for fifty years—inform me that, although well acquainted with the Twite and its nest, they have never found one with a Cuckoo's egg, much as they have desired to do so. But the case is one in which it is difficult to obtain satisfactory proof either on the positive or the negative side. Independently of dealers, there is, I admit, good evidence for the occasional depositing of a Cuckoo's egg in a Twite's nest. The authority of Mr. Bidwell, Dr. Rey, and others, quoted by the Editor, is certainly great. I have not been able to look up the references, and will not question them, as these well-known ornithologists are not likely to value evidence at more than it is worth. A Cuckoo, no doubt, may place its egg in almost any nest which it can get at. I have lately heard of a case, on what seemed good authority, of a Cuckoo's egg having been found in a Pheasant's nest, the female Cuckoo having been seen to fly from the spot. But this, I think, has been made clear, that for the Cuckoo in one neighbourhood to deposit its eggs exclusively in the nests of the seed-eating Twite was *à priori* very improbable. Whether a seed-eating bird is able to rear a young Cuckoo is a question upon which I would now invite evidence. Has anyone ever seen a young Cuckoo reared by a Goldfinch, Greenfinch, Bullfinch, or Linnet? Mr. Moffat's interesting experiment (Zool. 1905, p. 431) loses a little of its value from the fact that it was made thirty years ago, and that he has kept no record of it, depending, as he informs me, solely upon memory. It ought, however, to be easily repeated, and perhaps has been tried by others whose experiences would be interesting. "Sauce for the goose is sauce for the gander," but it does not follow that a strange food which succeeded with young Hedge-Sparrows would also succeed with a young Cuckoo. It is well known that a nestling Thrush or Blackbird can be reared on bread soaked in milk, but in the case of the young Cuckoo there would be other considerations besides the strangeness of the food. The usual foster-parents of the Cuckoo are long-billed insectivorous birds, and anyone who has watched a Wagtail or Meadow-Pipit feeding a young Cuckoo with an insect held at the tip of its beak, and darted quickly into the open gape of its monster child, apparently at the risk of being itself swallowed, will ask what would happen in the case of a Bullfinch, with its short blunt beak, if it attempted to feed the young Cuckoo by disgorging seeds from its crop, a process which generally lasts for a minute or more. Here surely is a field for inquiry. Do such birds feed the young Cuckoo (if they ever feed it at all) in the same way in which they feed their own young, or do they alter their habits to suit the occasion, and obtain for the intruder its natural food —insects?—ALLAN ELLISON (Watton-at-Stone, Herts).

White-tailed Eagle (Haliaëtus albicilla) in Staffordshire.—On Nov. 30th, 1905, Mr. Guy Harris, of The Radfords, Stone, Staffordshire, observed an Eagle at about 12.30 p.m. coming from the south-east. It then circled round for some fifteen minutes, and he was able to observe it carefully through field-glasses. It went away in a westerly direction, and was next heard of at Sandon (about five miles distant), where it is said to have been shot at several times, and eventually, on Dec. 4th last, it was trapped by one of Lord Lichfield's keepers on Cannock Chase. The bird is now being preserved for his lordship, and the taxidermist states that it is a young White-tailed Eagle (a female), and that the measurements are as follows:—"Length from tip of bill to tip of tail, 38 in.; breadth from tip to tip across the back, 93½ in.; length of flight from tip of wrist to the end of tip of primaries, 28¼ in.; length of tail from root of tail to the end of rectrices, 14⅞ in." He adds: "The bird was very fat, and showed no indications of having been in a cage, and I believe that it is a perfectly wild bird." This is the first authentic record of the occurrence of this bird in Staffordshire, although it is now practically certain that the two Eagles mentioned in Shaw's 'History of Staffordshire' (1798) were of this species. It may be of interest to refer to my note on this subject, which appeared in the 'Transactions' of the North Staffordshire Field Club, 1902–03, p. 63.—JOHN R. B. MASEFIELD (Rosehill, Cheadle, Staffordshire).

Whoopers in Islay.—On Ardnave, a fresh-water loch in the north of the island of Islay, which I visited on Dec. 6th, 1905, I saw as many as ninety-eight Wild Swans—I think, all Whoopers. The birds, in brilliant sunshine on the dark blue water, were a beautiful sight. The loch is not half a mile across, and, besides many Gulls and Coots, had on it Mallards, Wigeons, Golden-eyes, Tufted Ducks, Pochards, and a pair of Pintails; the latter are the first I have seen in Islay, and, according to Mr. Harvie-Brown's 'Fauna of Argyll,' they are rare in the Inner Hebrides. In December, 1900, I saw twenty-seven Whoopers on Ardnave Loch, and I am told some come every winter, but I imagine that ninety-eight is an unusually large number. — Flora Russell (2, Audley Square, W.).

Colour of Eyes in Fuligula nyroca. — On Jan. 1st I handled a locally and fresh-killed immature specimen of the White-eyed Pochard (not a hybrid), the irides of which were light brown, without any trace or shade of white. Can the authorities be wrong, as no writer known to me suggests the elimination of white from the eye of this species at any age? The eye of the Common Pochard is generally given as red or pink in the adult male, but this is only the case in over-yeared birds, and then seldom before January. I have on several occasions noticed this colour fade to yellow shortly after death, or even before in birds that I have shot.—Maurice C. H. Bird (Brunstead Rectory, Stalham, Norwich).

Eider (Somateria mollissima) in Cheshire.—On Dec. 31st (1905) an Eider—a duck or a drake in the plumage of the first winter—was swimming close inshore at Leasowe. Sheltered from the gale, which was blowing from the south-east, the bird was diving for food in the quiet water under the lee of the sea-wall, and I was able to get within a few yards of it, sufficiently close to distinguish with a glass the feathered wedge on the upper mandible, and the details of its plumage, although I could not make out upon what it was feeding. When it saw me the bird got on the wing, and, keeping well in the shelter of the embankment, flew just above the water for about a quarter of a mile. Then it dropped and began to feed, affording me another opportunity to approach and watch it at close quarters. The Eider is a rare species on the north-west coast of England, and has only once before been recorded for Cheshire.—Chas. Oldham (Knutsford).

Interesting Hybrid Duck.—When walking up and down the ranks of Yarmouth Market on Jan. 20th, as is my usual custom on Saturdays during the shooting season, in search of any interesting fowl that may turn up, I was attracted by an odd-looking Duck strung up by the neck with a Mallard, hanging on a slate. On closer inspection I found it to be a remarkably pretty hybrid between a Mallard and a Black East Indian Duck. The head was glossy greenish black, as was the back. Underneath the bird was a patch of white, with another spot of white on the "throat," and the breast was a dark brown. The black feet were small, the toes only showing a brown streak, and the black upper mandible was relieved by a light brown patch on either side. The bird was in fine condition, and undoubtedly a male. I should have purchased it, but the good woman "couldn't for the life on her" say the price of it, as her husband had not "set the figger." I should have taken the liberty of making a sketch of it, only I had not wherewith by me to do it. I therefore made another quick examination of it, but had not the chance of again calling round to purchase it.—Arthur H. Patterson (Ibis House, Great Yarmouth).

Sea-going Pigeons.—A remarkable instance of tame Pigeons making a daily visit to a lightship has recently come under my notice. Some eighteen months since a Pigeon, in hazy weather, made its appearance on the St. Nicholas lightship, which is moored a mile and a half from the town. It was fed, and, being unmolested, rested awhile, and shortly flew back to the shore. Not long after it voluntarily made its appearance on the vessel, was fed again, and once more returned. It learned to recognize the tin in which some corn was kept, and would soon come aboard when it saw the "signal" flashed by holding up the tin above the bulwarks. Shortly after another bird, somewhat shyer, ventured on the trip with it, and was made welcome; and in time no fewer than five birds made it a daily practice to honour the delighted seamen with their presence. They do not seem all related, although two may probably be young birds belonging to the first pair. They still visit the ship, alighting first on the davit-guys, and then descending to the deck to feed, after which they fly away home for the rest of the day. Such an instance is, I think, unique, and worthy of record. — Arthur H. Patterson (Ibis House, Great Yarmouth).

Peculiar Habits of Gallinula chloropus. — In Rickmansworth, during Christmas week, I noticed a Waterhen perched on an ivy-covered tree in the churchyard, about twenty-five feet up, and busy feeding on the ivy-berries, pecking vigorously at the bunches. As the weather was quite open, and neither the ground nor the adjacent waters were frost-bound, this unusual kind of food for a Waterhen seems worth a note.—M. J. C. Meiklejohn (Tentsmuir, Northwood, Middlesex).

Knot inland in Cheshire.—On Dec. 30th, 1905, a gamekeeper, when shooting Snipe on the borders of Marbury Mere, near Norwich, killed a female Knot. The bird, which is now in the Grosvenor Museum, Chester, was in very poor condition. Though Knots occur—sometimes in large numbers—almost every winter in the Dee Estuary, they are seldom met with inland in Cheshire; I only know of one other occurrence—a bird which struck the telephone-wires in Bowdon on Oct. 24th, 1902 (Zool. 1902, p. 467). Knots do not as a rule venture far up the Dee estuary, but on this same day some were killed out of a mixed flock of Knots, Redshanks, and Dunlins near Connah's Quay. On the following day Mr. C. Oldham saw many flocks between Parkgate and West Kirby. He estimated that one of these flocks contained at least two thousand birds, and another perhaps half that number.—T. A. Coward (Bowdon, Cheshire).

Interesting Acquisitions by the Grosvenor Museum, Chester.—A very remarkable form of Kestrel-Hawk (*Falco tinnunculus*), sex (?), has been taken in North Wales, and presented to the Natural History Museum, Chester, by R. Farmer, Esq. Having never before seen a more remarkable and beautiful variety of the *Falconinæ*, I thought it worthy of record. The structure of the colour-markings is almost identically the same as in the type, but the colour is of a light fawn and greyish white. Variety of Blue Tit (*Parus cæruleus*), sex (?), shot near Chester, and presented to the Natural History Museum, Chester. Head, neck, wings, and tail French grey; back and under parts canary-yellow; eyes pink. Size rather smaller than the type. A very remarkable form. I was told that the bird seemed semi-domesticated when alive.—Alfred Newstead.

PISCES.

Flying Fish reported from Yarmouth (?).—The records in 'The Zoologist' of the occurrence of Flying Fish on the Kentish coast are interesting, and recalled to me an account of one whose "fin" was exhibited in the Fisheries Exhibition in London in 1883. I have hunted up a catalogue of exhibits made by the well-known Norwich naturalist, Mr. T. E. Gunn, and find the following:—

"Case 50, Flying Fish.—Fin of Flying Fish (*Exocœtus volitans*); specimen caught off Yarmouth, May 23rd, 1868. . . . Only known instance on this part of the eastern coast. I submitted it to the late Dr. J. E. Gray, of the British Museum, who identified the species for me."

For many years I have watched for an example to turn up, but as yet without success. I have not included this "capture" in my 'Nature in Eastern Norfolk,' for the simple reason that neither in the second edition of Lubbock's 'Fauna of Norfolk,' nor in any of the 'Transactions' of the Norfolk and Norwich Naturalists' Society, is Mr. Gunn's specimen referred to. It would be as well, however, for all east coast naturalists to be on the *qui vive*, and help to more firmly establish the claim of this fish to be upon the Norfolk list.—A. H. Patterson (Ibis House, Great Yarmouth).

CRUSTACEA.

Arctus ursus (better known as Scyllarus arctus) at Guernsey.—A specimen of this rare and curious crustacean, a native of the Mediterranean, was caught off Guernsey, in a pot baited for the "Chancre" or Edible Crab, measuring five inches in length, and of a dark red-brown colour. Three or four specimens are usually found during the summer round the island of Guernsey.—F. S. Wright (Guille-Allès Library, Guernsey).

[In earlier volumes of 'The Zoologist' there are many records of this species being found in English waters, especially in the neighbourhood of Cornwall and Plymouth. It has also been figured in these pages (1879, p. 473), where Mr. Thomas Cornish gave an interesting communication respecting its British records.

It may be well to draw attention to an error in Parker and Haswell's 'Text-Book of Zoology,' vol. i. p. 539, where a figure is stated to represent this species, but is really that of *Thenus orientalis*.—Ed.]

OBITUARY.

Charles John Cornish.

At the early age of forty-seven this pleasant writer on natural history and sporting subjects passed away on Jan. 30th, after an illness extending over three months. He was a Devonshire man, and was the son of the Rev. C. J. Cornish, who afterwards removed to the rectory of Childrey, at the foot of Berkshire Downs. It was in this happy region that he probably was imbued with the sights and sounds of country life, and, without making claim to be a profound zoologist, became an established writer on different aspects of the varied life around us. Several of his books have been reviewed in these pages. Since 1884 he had held an assistant mastership at St. Paul's School, and this, combined with his outdoor recreations and his literary occupations, the outcome of a too active temperament, terminated in a premature death by overwork. He was much endeared to his friends.

NOTICES OF NEW BOOKS.

Creatures of the Night; a Book of Wild Life in Western Britain. By Alfred W. Rees. John Murray.

We are glad to read another book written by the author of 'Ianto the Fisherman,' of which a notice appeared in our last volume. Mr. Rees again proves himself to be an observant naturalist, and it is only a few indeed who can, or who are inclined to, follow his nocturnal watchings. Of course it was found impossible to restrict all the observations to those made during midnight vigils, especially those relating to an active diurnal creature like the Water-Vole, and what we really peruse is a description of the night and day habits of seven most interesting species of British mammals. Then again the animals are made to tell their own narrative, an effort fatal to an author who is either not sure of his facts, or who has not a sufficiency of his own observations to enable him to tread on the very firmest ground of information; from both of these dangers Mr. Rees suffers no impediment.

The importance of this volume, which we consider almost unique, is in the recital of the life struggles of all these creatures, and their intelligent, not automatic, efforts to preserve their existence and comfort. If disease and poverty are the worst menaces to human life, other animals without the tribal organization possessed by man, are subject in an even more drastic way to the constant terror of sudden death or starvation; to eat and not be eaten, or to kill and not be killed, seems at least the great problem of their existence, and to them there is a constant terror by noonday as well as by night. And yet their happy moments are probably as frequent as our own, and from the pages of this book we see no indication of a difference in kind, but only of degree in the method of *wisdom*, not of *intellectuality*, pursued by man and other animals in the struggle of life.

The story of the Water-Vole is delightful; that is one of the animals which know a little of two worlds—the surface of the earth as we do, and much of the dusky realm of water which we do not.

Nature's Nursery. By H. W. Shepheard-Walwyn, M.A., &c. Hutchinson & Co.

This is one of those books which tell us many ordinary and elemental biological facts which we are all supposed to know, but which many of us do to a very imperfect degree, and it is a publication which relies largely on the beauty and efficacy of its photo-blocks, which are as informative as the text. As regards the last we have only one complaint—the failing of too many popular lecturers on these subjects—and that is, the desire to be funny. It is well to avoid the pedantic attitude, but mild jokes in the end sometimes become too strong for the average reader.

Part I. is devoted to "The Tale of the Chicken," which can be strongly recommended to the perusal of all lovers of poultry who would desire to have some knowledge on the hatching processes of their pets; the series of twenty-one photographs taken of a chicken between the ages of eight hours, and two weeks, is worthy of a place in every poultry book, while those of some full-grown specimens are in strong contrast to the rigid caricatures we so often find in publications on this subject, and which might represent the art of a very ordinary birdstuffer.

The part descriptive of "Flora's Nursery" is also calculated to give a well-illustrated insight into many interesting points of seed dispersal, and fertilization, incidental to many well-known plants, and the volume should certainly be placed on the list of useful and interesting prize books.

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